

REMARKS

Summary of the Office Action

Claims 18, 19, 21, 25-29 and 31-33 and 36-45 were pending.

Claims 18, 19, 21, 25-29 and 31-33 were withdrawn from consideration by the Examiner as being directed to a constructively non-elected invention.

Of the claims considered, claims 36-45 have been rejected under 35 U.S.C. § 112 as being indefinite. Claims 36-45 also have been rejected under 35 U.S.C. § 112 as being drawn to non-statutory subject matter. Claims 36, 38 and 44 have been objected to because of informalities.

Applicants' Reply

Withdrawal of Claims from Consideration

Applicants respectfully traverse the constructive election of invention and the withdrawal of claims 18, 19, 21, 25-29 and 31-33 from consideration.

The Office Action states that these claims involve the generation and use of oriented network graphs, but that the invention as originally filed and claims 34-35 do not involve the generation and use of oriented network graphs. The Office Action justifies the constructive election of invention purportedly on the grounds applicants have received an Office Action on the merits of the originally presented invention (presumably referring to the Office Action dated November 15, 2004).

Applicants' disagree with the present Office Action's narrow characterization of scope of the two sets of claims, which are both directed to different but similar aspects of the same invention, which as previously noted relates to designing biological molecules for pharmaceutical or other applications. The withdrawn claims 18, 19, 21, 25-29 and 31-33 as recited are directed to "a method for finding a most likely biological pathway of a set of interacting molecules," which is also the subject matter of claims 36-45.

Conversely, claims 36-45 as recited are directed to “a method for identifying a molecular interaction network representation,” which is also the subject matter of the withdrawn claims.

Applicants note that the Office Action dated November 15, 2004 (see pages 5-6 thereof) found the originally filed invention (claims 1-6 and 13-14) to be anticipated because its “graphing” and “network” features were allegedly shown by Kim et al. US 2002/0087275 A1 and Askenazai U.S. Patent No. 6,594,587. These are the very features of the originally presented invention, which the present Office Action correctly ascribes to the withdrawn claims, but then contradictorily uses to associate the claims with a new “non-elected” invention. Therefore, applicants respectfully request reversal of the constructive election and an examination of claims 18, 19, 21, 25-29 and 31-33 on their merits in the present application.

Claim Objections

Claims 36-45

Applicants have amended claims 36, 38 and 44 to address the informalities that were kindly noted by the Examiner.

§ 112 and § 101 Rejections

Applicants respectfully traverse the § 112 and § 101 rejections of the claims.

§ 112 rejections

Claim 36

Applicants have amended the recitation of step (a) in claim 36 to correct the antecedent basis of the term “known biological system networks” and to describe the relationship of “determining attraction probabilities” and “quantifying the occurrence frequency. ”

Applicants respectfully disagree with the Office Action that the various probabilities recited in the claims are not defined in the specification. Applicants note, for example, ¶ [0023] defines “edge probability” and describes the method for calculating the same, and ¶ [0024] defines “network topology,” “incoming edge,” and “outgoing edge” probabilities and describes the method for calculating the same. In any case applicants have now amended the claims to include explicit definitions for these probabilities.

Applicant’s note that the term “posterior probability” is commonly used and readily understood in the art (e.g., statistics) to refer to “conditional probability.” Further, it is known in the art that Bayes Theorem provides expressions for calculating a posterior probability. (See e.g., en.wikipedia.org/wiki/Posterior_probability). Equation 10 of the specification page 21, provides an explicit Bayesian definition of “posterior probability.”

Claim 38

Applicants note that “attraction probabilities” or “probabilities of attraction” (as in the amended claim 38) are defined in ¶ [0028]. Further, applicants have amended claim 38 to replace “molecular interaction probabilities” by “probabilities of molecular interactions” whose definition is provided by the remainder of the clause (d) (i.e. molecular interactions of said molecule with each of the other interacting molecules based on the probabilities of attraction.)

Claim 39-40

With respect to the equations 5, 6, 14 and 17 recited in these claims, Applicants note that the specification provides explicit expressions for these equations with definitions of each of the variables in the expressions, and further provides description on how to solve or compute these equations. (See e.g. ¶ [0028] which provides an expression for attraction probability i.e., equation (6) claim 39, defines the variables, and describes computation features). The attraction probability calculated by the manner of claim 39 is used in the claim 38 method for identifying a molecular interaction of a molecule within a biological network of interacting molecules.

Applicants submit that based on the disclosure in the specification, which includes working examples, a person in the art would know exactly what needs to be done to compute the claimed equations for identifying a molecular interaction of a molecule within a biological network of interacting molecules

In view of the foregoing, applicants respectfully submit that the pending claims conform to all requirements of § 112.

§ 101 rejections

Claims 36-43

As kindly suggested by the Examiner, applicants have amended claim 36 to include explicit language that the results are tangibly provided to a user or further processor.

Claims 44-45

Applicants reiterate and incorporate by reference arguments presented in the Reply dated March 29, 2006.

Applicants respectfully submit that claim 44 is directed toward a screening method for identification of a compound capable of modifying the interaction between at least two molecules in a biology network. The claimed language: “introducing a test compound in the biology network, the test compound contacting said at least two molecules,” does not require a literal contact wet step as the Examiner states. A computer experiment is sufficient.

Even if the Examiner’s reading is correct, claim 44 has been now amended to read: “for testing whether a [single] compound is capable of modifying the interaction between at least two molecules in a biology network.” Applicants believe that with this amendment the Examiner’s concerns about undue experimentation are moot.

Applicants therefore request that the § 101 rejection be withdrawn.

Conclusion

Applicants respectfully submit that this application is now in condition for allowance. Reconsideration and prompt allowance of which are respectfully requested.

Applicants request that the Examiner should kindly contact the undersigned attorney by telephone for discussion in case there are any remaining issues that need to be resolved.

Respectfully submitted,

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